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1998

UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

SAMPLE COSTS

TO ESTABLISH A VINEYARD AND PRODUCE

~WINE GRAPES~

SAUVIGNON BLANC

LAKE COUNTY

Prepared by:

Karen Klonsky, U.C. Cooperative Extension Economist, Department of Agricultural and Resource Economics, U.C. Davis

Rachel Elkins, U.C. Cooperative Extension Farm Advisor, Lake County

Pete Livingston, U.C. Cooperative Extension Staff Research Associate, Department of Agricultural and Resource Economics, U.C. Davis

Cooperators:

Jim Hamilton, Lake Community Bank, Lakeport
Walt Lyon, Grower, Kelseyville
Bill Pickering, Guenoc Winery, Middletown
Brian Rose, Lake Community Bank, Lakeport
Larry Rogers, Grower, Kelseyville
John Roumiguiere, Grower, Lake County
Steve Taylor, Pacific Coast Farm Credit Services, Ukiah

1998 - SAMPLE COSTS TO

ESTABLISH A VINEYARD AND PRODUCE WINE GRAPES

Sauvignon Blanc

Lake County

INTRODUCTION

The detailed costs for vineyard establishment and wine grape production in Lake County are presented in this study. The hypothetical farm used in this report consists of a total of 40 acres, 35 of which are being established, 5 acres are in farmstead, roads, and pumping stations.

This study consists of Assumptions to Establish a Vineyard and Produce Table Grapes and eight tables. It is intended as a guide only. It can assist in production decisions, determining potential returns, and prepare budgets. Sample costs given for labor, materials, equipment and contract services are based on current figures. Some costs and practices detailed in this study may not be applicable to every situation. A blank, Your Cost, column is provided to enter your actual costs on Table 2 Costs Per Acre To Produce Wine Grapes and Table 3 Costs And Returns Per Acre to Produce Wine Grapes.

Tables included:

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For an explanation of calculations used for the study refer to the attached Assumptions, call the Department of Agricultural and Resource Economics, Cooperative Extension, University of California, Davis, California, (530) 752-3589 or call Lake County farm advisor Rachel Elkins (707) 263-2281.

This and other cost of production studies can be ordered from the Department of Agricultural and Resource Economics, U.C. Davis, or from selected county Cooperative Extension offices.

ASSUMPTIONS

The following are assumptions pertaining to sample costs to establish a vineyard and produce wine grapes in Lake County. Practices described are not recommendations by the University of California, but represent production procedures and materials considered typical of a well managed vineyard in Lake County. Costs and practices detailed in this study may not be applicable to all situations. Establishment and cultural practices vary by grower and iii.sonoma.edu/search~S1/; variations can be significant. These costs are represented on an annual, per acre basis. **The use of trade names in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products.**

Land. The vineyard is owned, managed, and operated by the grower. The vineyard is located in Lake County and is situated on land previously planted to orchards. The farm is comprised of 40 acres, 35 of which are planted with wine grapes. The other 5 acres are occupied by roads, irrigation systems, and farmstead. Land is valued at $7,500 per acre. This study assumes the land was purchased for planting a vineyard. Because only 35 of the 40 acres are planted to grapes, land is valued at $8,571 per plantable acre.

Vines. Sauvignon Blanc vines are planted on a 7' x 11' spacing with 566 vines per acre during the first spring. In the second year 2% or 11 vines per acre are replanted for those lost in the first year. Vines will be trained to up the t-post during the second and third years. The grapevines are expected to begin yielding fruit in three years and then be productive for an additional 22 years.

Trellis System. The trellis system is designed to support a quadrilateral, cordon-trained, and spur-pruned vineyard. Installation of the trellis system is performed by the owner and hired workers in the first two years. The trellis system is considered part of the vineyard since it would be removed at the time of vine removal and is shown in the vineyard establishment costs in Table 1. The following details the trellis system installation.

First Year Once the vineyard is laid out an end post is placed at each end of the rows. A three-foot screw anchor is drilled into the ground and wires are run up to the end post to keep it upright against tension. In between the end posts a nine-foot t-post is driven into the ground at the site of every other vine. The nine-foot posts will have the drip wire and crossarms attached and support the fruiting and foliage wires. At the alternate vine site a five-foot t-post is pounded into the row to allow the vine to be trained up the fruiting wires which are 40-42 inches above the ground. The 14 gauge drip line is clipped to each nine-foot post and anchored at the end of each row at the screw anchor. The drip irrigation line is attached to the drip wire.

Second Year A set of three crossarms are attached to each nine-foot t-post. Each crossarm varies in size from 36-48 inches with the largest at the top of the post, tapering down to the smallest at the bottom. The two top crossarms each have four 14 gauge, movable foliage wires; the lower arm carries two 12 gauge fruiting wires. The foliage wires are moved during the season as vines grow.

Irrigation and Frost Protection System. Since the vineyard is established on land previously planted to orchards, it is assumed to have a well which will be refurbished and a new pump, motor, and filtration/injector station will be installed along with the drip irrigation system during to planting. The well, 15 hp motor, pump, filtration station, fertilizer injector system, drip lines and the labor to install of these components is included in the irrigation system cost. Water is pumped to the vineyard after running through a filtration station into the drip lines along the vine rows. The irrigation system is considered an improvement to the property and has a 25 year life. Therefore, it is not found in preplant operations in Table 1 establishment costs, rather it is shown in the non-cash overhead sections as capital recovery cost of various tables and the Investments portion of Table 5.

The frost protection system consists of a 10 acre-foot reservoir, a 90 hp motor and pump, and overhead sprinklers. The reservoir is designed to hold enough water to protect the vineyard during the frost season. Water is pumped by the 90 hp booster pump to the overhead sprinklers. It is assumed that the vineyard will need frost protection for 12 nights during the season and the system will run for 6 hours per night. The reservoir, pump, and sprinklers are an investment, separate from the vineyard, and their costs are found in Table 5, Annual Equipment, Investment, and Overhead Costs. The cost of water used for frost protection is the cost of water pumped from the irrigation well to the reservoir and the cost to operate the booster pump during freezing periods.

Pumped water plus labor constitute the irrigation/frost protection cost. The cost is based on using 15 hp motor to pump from 75 feet deep over 35 acres. Price per acre-foot of water will vary by grower in this iii.sonoma.edu/search~S1/ depending on quantity pumped, power cost, various well characteristics, and other irrigation factors. In this study water is calculated to cost $4.93 per acre-inch. No assumption is made about effective rainfall. Irrigations occur from May through August in the first two years and June through August in the third year. Nitrogen fertilizer is injected into the drip system starting the first year. The amount of water applied to the vines varies and are shown in Table A.

Table A.	Applied Irrigation Water	
Year	Number of Months	Acln/Year
1-2	4	2.5
3	4	6.7
4+	4	9.2

ESTABLISHMENT CULTURAL PRACTICES

This vineyard is established on ground that had previously been planted to orchards. The land is assumed to be fairly level. The practices described below represents only the hypothetical vineyard in this study and may not be appropriate to your circumstance.

Site Preparation. The land is subsoiled twice to a depth of 2-3 feet breaking up any underlying hardpan to improve root and water penetration. Afterwards the ground is disced three times to break 'p large clods of Soil smoothing the ground in advance of leveling consists of three passes with a landplane. The Following spring, a pre-emergent, residual herbicide (Surflan®) is applied for weed control through most of the first year growing season. Subsoiling and leveling are contracted out to commercial companies. Most operations that prepare the vineyard for planting are done in the year prior to planting, but costs are shown in the first year. All operations that prepare the vineyard for planting are done in the year prior to planting, but costs are shown in the first year in Table 1.

Planting. Planting the vineyard starts by laying out and marking vine sites in early spring. The first year's component of the trellis system is installed. Holes are dug, vines are planted, and a milk carton is placed around the vine. In the second year, 2% of the vines or 11 vines per acre are replaced after dying during the first season.

Pruning, Training, and Crop Thinning. A number of similar, but different cultural operations are performed during pruning and training. Not all of the same practices are used for other varieties or trellis systems.

The second year begins with a dormant pruning during the winter. Training includes suckering, tying, and training the selected cordons and spurs. Suckering is the removal of sprouts from the rootstock that compete with the trunk and cordons for water and nutrients.

Training continues in the third year but requires half the labor-hours to complete. Suckering and retying require the majority of the time involved and continues throughout the life of the vineyard.

Insect and Anthropod Management. Insects and mites are managed by using different pesticides and management techniques beginning the first year. Pest populations are monitored to determine when an economically damaging level will occur and which control method to use. From the second year on an application of insecticide is sprayed to manage leafhoppers. Beginning in the third year a miticide is applied in July to control mites.

Disease Management. There are many pathogens that attack grapevines, but the only major disease that is assumed to occur in this study is powdery mildew. A dusting and spraying program for powdery mildew control begins the second year with single application of sulfur dust and increases to eight applications in the third year. Also in the third year, three wettable sulfur treatments are made with the first application mixed into the leafhopper spray. A sterol inhibitor is applied for additional mildew control in the fourth year. All applications are made using a 50 HP tractor and an vineyard sprayer.

Vineyard Floor Management. Weed control in the vine row and middles are managed with hand hoeing, multiple discings, and herbicides. The vine rows are hand hoed during the first two years only. The row middles are disced from March through August. The middles are disced four times every year. The vine rows are stripped sprayed with different herbicides during winter and summer each year. The summer strip spray is applied on only half of the acreage.

Fertilization. Nitrogen is injected into the drip irrigation system beginning in the first year at 10 pounds of N per acre.

Establishment Cost. An establishment cost Is he sum of the costs for land preparation, trellis system, planting, vines, cash overhead and production expenses for growing the vines through the first year that grapes are harvested. It is used to determine the non-cash overhead expense, capital recovery cost, during the production years. The Total Accumulated Net Cash Cost on Table I in the third year represents the establishment cost. For this study the cost is $8,640 per acre or $302,400 for the 35 acre vineyard. The establishment cost is amortized over the remaining 22 years the vineyard is in production.

PRODUCTION CULTURAL PRACTICES

Pruning and Suckering. Pruning is done during the winter months and the prunings are first chopped with a flail mower then disced into the row middles. Suckers are removed from the trunks each year.

Vineyard Floor Management. Herbicides and cultivation are use to manage the vineyard floor and control weeds. Four discing are performed in March through August. Vine row weeds are controlled with a pre-emergent herbicide mix applied as a strip spray during the winter and escaped weeds are controlled with a summer application of a contact herbicide.

Insect And Arthropod Management. Pest management techniques used to control insect and disease problems in the last year of vineyard establishment are the same practices used in the production years.

Disease Management. Powdery mildew is treated beginning in April with an application of sulfur dust followed with nine more dustings. Three applications of wettable sulfur are made April through August. One treatment of wettable sulfur is mixed with the leafhopper spray. A single sterol inhibitor treatment is made in July. All of the insect and fungicide sprays are made using the rented 50 HP tractor and vineyard sprayer.

Pesticides, rates, and cultural practices mentioned in this cost study are a few of those listed in the UC IPM Pest Management Guidelines, Grapes and Grape Pest Management. Written recommendations are required for many pesticides and are made by licensed pest control advisors. For information and pesticide use permits, contact the local county Agricultural Commissioner's office. For additional production information contact Lake County viticulture farm advisors.

Harvest. Harvesting starts in the third year. In this cost study the vineyard contracts to have the grape crop custom harvested by hand and is charged on a per ton basis. The third year the contract rate is $110 per ton because of the small tonnage, but falls to $95 per ton in the fourth year. It is assumed in this study that the grower rents a forklift, several tractors, and 12 gondolas with bins to manage an efficient harvest. Hauling to the crusher is also contracted for and paid by the grower. It is assumed that the grower is hauling to a winery outside of the county and the cost would be approximately $15 per ton.

Assessment. The Lake County Wine Grape Commission (LCWGC) is a local entity performing marketing and research for growers. The current assessment rate is 1 % of the gross value of the grapes and is collect by the wineries.

Yields. Wine grapes begin bearing an economic crop in the third year after planting. Yield maturity is reached in the sixth year. An assumed yield of 7 tons per acre is used to calculate cost per ton in production years. The annual yields are measured in tons as shown in Table B.

Table B.

Annual Yields of Sauvignon Blanc in LakeCounty (District 2)				
Year	3	4	5	6+
Tons Per Acre	1.5	3.0	5.0	7.0

Returns. Return prices per ton for wine grapes are determined by variety and percent sugar. The effect of sugar percentages on prices is indicated in Table C by the low and high returns received. The lowest price in the last four years was $425 per ton while the high was at $815; the average 1996 price for Sauvignon Blanc was $658

per ton. Use of return prices for grapes is for calculating net returns to growers at different yields and price. Returns, shown in Table 7 will vary and the yields and prices used in this cost study are an estimate taking into consideration variety produced, fruit quality, and current market conditions. An estimated price of a $900 per ton of Sauvignon Blanc wine grapes is used in this study.

Table C.

Annual Prices Received by Lake County (District 2) Growers for Sauvignon Blanc Over Five Previous Harvests[1]

	$ / Ton		
	Range		
Year	Low	High	Weighted Average
1992	430	775	680
1993	450	738	662
1994	425	815	652
1995	600	750	658
1996	600	682	658
Average	501	752	662

[1]Data compiled from the Final Grape Crush Report. 1992-1996 Crops.

Risk. The risks associated with producing wine grapes should not be minimized. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks which affect the profitability and economic viability of wine grape production.

Risk is caused by various sources of uncertainty which include production, financial. Examples of these are insect damage, a decrease in price, or an increase in interest rates. Due to the risk involved, access to a market is crucial. A market channel should be determined before vineyards are planted and brought into production.

Labor. Hourly wages for workers are $8.00 and $6.00 per hour for machine and non-machine workers, respectively. Adding 34% for Workers Compensation, Social Security, Medicare, insurance, and other possible benefits give the labor rates shown of $10.72 and $8.04 per hour for machine labor and non-machine labor, respectively. Labor time for operations including machinery are 20% higher than the operation rime given in Table 2 to account for the expeditor involved in equipment set up, moving, maintenance, work breaks, and field repair. Wages for a manager are not included as cost. Returns above total costs is considered a return to management and risk.

Cash Overhead. Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm, not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, and equipment repairs.

Property Taxes. Counties in California charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis. The salvage value for land is equal to the purchase price because land does not depreciate from use.

Interest On Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 10.46% per year. A nominal interest rate is the going market cost of borrowed funds.

Insurance. Insurance for farm investments vary depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.713% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $469 for the entire farm.

Office Expense. Office and business expenses for 35 acres are estimated at $6,000 annually or $171 per planted acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc.

Non-cash Overhead. Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Although farm equipment used on farms in Lake County may be purchased new or used, this study

shows the current purchase price for new equipment. The new purchase price is adjusted to 50% to indicate a mix of new and used equipment. Annual ownership costs (Equipment and Investments) are shown in Tables 1-3 and 5. They represent the capital recovery cost for investments on an annual per acre basis.

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). Put another way, it is equivalent to the annual payment on a loan for the investment with the downpayment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The calculation for the annual capital recovery costs is as follows:

[(Purchase Price - Salvage Value) x (Capital Recovery Factor)] + [Salvage Value x Interest Rate]

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its life. For farm machinery (e.g., tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The life in years is estimated by dividing the wear-out life, as given by American Society of Agricultural Engineers (ASAE) by the annual use in hours. Salvage value is calculated as

New Price x % Remaining Value

Salvage value for other investments including irrigation systems, buildings, and miscellaneous equipment is zero. The salvage value for land is equal to the purchase price because land does not depreciate from use. The purchase price and salvage value for certain equipment and investments are shown in Table 4.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. It is the function of the interest rate and years of life of the equipment.

Interest Rate. The interest rate of 7.81% used to calculate capital recovery cost is the United States Department of Agriculture-Economic Reporting Service's (USDA-ERS) ten year average of California's agricultural sector long-run real rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector, not including inflation. In other words, the next best alternative use for these resources is in another agricultural enterprise.

Equipment Costs. Cash equipment costs are composed of three parts; non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of fuel, lubrication, and repairs.

Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the ASAE. Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO hp, and type of fuel used. The fuel and repair cost per acre for each operation in Table 2. is determined by multiplying the total hourly operating cost in Table 6. for each piece of equipment used for the cultural practice by the number of hours per acre for that operation. Tractor time is 10% higher than implement time for a given operation to account for setup time. Prices for on-farm delivery of diesel and gasoline are $0.78 and $1.22 per gallon, respectively.

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REFERENCES

American Society of Agricultural Engineers 1994. *American Society of Agricultural Engineers Standards Yearbook*. Russell H Hahn and Evelyn E. Rosentreter (ed.) St. Joseph, Missouri. 41st edition.

Boelje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, New York.

California Department of Food and Agriculture. 1993. Final Grape Crush Report 1992 Crop. California Agricultural Statistics Service and Federal State Market News Service. Sacramento, California.

California Department of Food and Agriculture. 1994. Final Grape Crush Report 1993 Crop California Agricultural Statistics Service and Federal State Market News Service. Sacramento, California.

California Department of Food and Agriculture. 1995. Final Grape Crush Report 1994 Crop. California Agricultural Statistics Service and Federal State Market News Service. Sacramento, California.

California Department of Food and Agriculture. 1996. Final Grape Crush Report 1995 Crop. California Agricultural Statistics Service and Federal State Market News Service. Sacramento, California.

California Department of Food and Agriculture. 1997. Final Grape Crush Report 1996 Crop. California Agricultural Statistics Service and Federal State Market News Service. Sacramento, California.

Integrated Pest Management Education and Publications. 1990. *U. C. Pest Management Guidelines, Grapes.* In M. L. Flint (ed.) UC IPM pest management guidelines. University of California. Division of Agriculture and Natural Resources. Oakland, California. Publication 3339.

University of California, Division of Agriculture and Natural Resources. 1992. *Grape Pest Management.* Donald L. Flaherty, et. Al. (ed.) Second Edition. University of California, Division of Agriculture and Natural Resources. Oakland, California. Publication 3343.